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26 April 1955

Chief, P&E/OSI

ATTN : [redacted]

25X1A9A FOIAB3B1

Acting Chief, [redacted]OO

Report on Atypical Static Observed at [redacted] 25X1A6A

1. Submitted herewith in response to your verbal request of several weeks ago is a report based on observations of atypical
25X1A6A static conditions near [redacted], during 1954 and 1955 (attachment A); a plot of the antenna field used in the compilation of the observations for the above report (attachment B); an azimuthal equidistant projection of the world centered on [redacted] 25X1
25X1A6A sufficiently close to [redacted] to give good approximate idea of the world sectors covered by the directional antennas (attachment C); and two samples recorded on tape at 7½ inches per second on two different occasions under conditions described in attachment A (attachments D and E respectively).

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2. [redacted] interest in atypical static observed at [redacted] resulted initially from the unprecedented scope of the interference created by a condition observed in March 1954; from its relation to an effect associated with one of the early [redacted] FOIAB3B1
personnel formerly stationed in Southern California; and from the
FOIAB3B1 fact that [redacted] was left with the apparently mistaken impression that a Soviet nuclear explosion had taken place in March 1954.

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3. Continued interest on the part of [redacted] resulted from additional observation of recurrences of the static condition in March and April 1955, although in different context after the apparent high degree of correlation with current nuclear tests [redacted] was noted. 25X1

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4. [redacted] also considers it has a legitimate interest in any future recurrence of this condition regardless of the immediate finding in connection with the data here submitted:

a. If a positive relationship with nuclear effects is
FOIAB3B1 found, [redacted] wishes instructions as to what its future reaction should be, particularly at times when no American tests are known to be conducted.

25X1 [redacted] egative relationship is found, the question still the cause of the condition, a matter potentially rational concern to this organization.

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5. The diagram of the antenna field at [redacted] is submitted to clarify any questions regarding the nature of the antennas whose directivities are noted throughout the report. The long-wire "B" antennas are standard Beverage Wave construction and unidirectional toward the perimeter except in the case of B-1, which is reversible. The diamond antennas are all triple curtain rhombics, unidirectional toward the perimeter (i.e. away from the operations building). The frequency range of the receiving equipment normally used is 100 to 54000 ke/s. Technicians making the observations were somewhat hampered by lack of precedent in reporting of this type, as a result of which the consistency and continuity of information leaves something to be desired; however, they attempted to be objective on those facts reported.

[redacted]

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Observations of Atypical Static Conditions near [redacted] during 1954 and 1955.

1. A condition of severe static, resembling the crackling of normal atmospherics in character but building up to much greater intensity and frequency of occurence than has been experienced from normal natural causes, was first observed by the monitoring station of the [redacted] 25X1A7B
25X1A7B [redacted] on 23 March 1954. The condition observed then and on successive occasions in the spring of 1955 was particularly distinguished by the virtually continuous nature of the disturbance, its abnormal frequency range, and the unusually long period during which it persisted. Local thunderstorms sometimes create a disturbance approaching this condition in its milder stages, but they have never persisted for as many hours and are always readily recognizable
FOIAB3B1 from immediate weather conditions. [redacted] personnel with experience in sub-Arctic regions have noted some similarity with disturbances due to
FOIAB3B1 auroral effects; [redacted] has operated at [redacted] since 1949 and has never 25X1A6A observed any disturbance of this type attributable to auroral conditions.

a. The static disturbance on 23 March 1954 was not immediately distinguished from normal conditions, hence its initial audibility was not recorded. At 1130 GMT the intensity and frequency range of the disturbance had increased to the point where it was recognized as a singularly atypical condition. Although first noted on low frequencies (below 400 kc/s), it rapidly spread through all higher frequencies observable at that time, the upper limit then being 30 mc/s. Natural static had never before been observed with any significant intensity on these higher frequencies, and never with such great intensity in the frequencies 7 to 10 mc/s, which appeared to be the peak range of disturbance. Experiments with various antenna directions revealed that the condition persisted regardless of antenna in use, although was most pronounced when the rhombic antenna R-5 (bearing 99° true) was used. At peak intensity the static obliterated all radio signals throughout the spectrum; it gradually subsided until at 0500 GMT, 24 March 1954, normal atmospheric conditions prevailed and radio reception was again at normal level.

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b. Technicians of [redacted], [redacted], who had formerly worked at
FOIAB3B1 the [redacted] monitoring station located at [redacted] (near 25X1A6A
25X1 [redacted] recalled that a similar disturbance was experienced
25X1A6A at [redacted] several years previous during one of the initial tests of the Atomic Energy Commission [redacted] 25X1
though they did not remember the degree or intensity to be as great. Regrettably there are no records on this occurence available from [redacted]

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2. No further disturbance of this type was noted until 2 March 1955 when there was a gradual build-up of the condition described in the preceding paragraph. It was first perceived at 1300 GMT on the low frequencies (150-400 kc/s) and gradually increased in intensity and frequency range through 2200 GMT when it was definitely discernable in the high frequency spectrum above 4 mc/s. As the "static" level seemed to have a tendency to peak in certain bands of the short-wave spectrum, the build-up on higher frequencies was therefore not in a straight line relationship with respect to frequency. By 2330 GMT on 2 March the condition was monitored on frequencies as high as 50 mc/s (the high frequency limit of receiving equipment at this time was approximately 54 mc/s). At its maximum the condition was observed over all directional antennas but gave indefinite indications of emanating from the northwest quadrant. The period of strongest disturbance was approximately 2100-2300 GMT and was described as displaying a tendency toward slow, rolling fading; it was, however, considerably weaker than the condition observed one year before (paragraph 1 above) and did not interfere with normal strong signal reception. Observed on the oscilloscope it showed spikes rising considerably above normal atmospheric characteristics and artificial static such as caused by heavy rains on the antennas. There was no storm in the [redacted] area at the time.

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3. The same atypical condition was next observed on 14 March 1955 25X1A6A at [redacted] It was first heard at 1140 GMT in the low frequency (150-400 kc/s) range with strongest readings on the B-5 antenna oriented 23° true; weak readings were also obtained with antennas B-1 and B-8 oriented 281° and 101° true respectively. The condition was not audible on other antennas or other portions of the spectrum. This condition prevailed through 1300 GMT.

a. At 1330 GMT the disturbance appeared quite suddenly in the high frequency portions of the spectrum with strength peaking at approximately 1 mc/s intervals up to 39 mc/s where the strongest disturbance was observed. Nothing was noted above 39 mc/s. At 1355 GMT the static suddenly disappeared from the lower frequency half of the range of disturbance; the line of demarcation was not sharp but a gradual fade from the higher frequencies. A strong wind and rain storm occured in the area at that time; as the storm abated the static condition reappeared in the lower frequency portions of the spectrum and continued past 1945 GMT when the rainfall stopped completely.

b. During the remainder of the GMT day 14 March, the condition persisted with directivity strongest from the north and slightly east of north; disturbance peaks on the higher frequency appeared around 8.4, 11.1, 16.3, 25.5 and 43.0 mc/s. During the early hours of 15 March it was not possible to maintain detailed observation,

but a gradual build-up of static interference was noted; at 0600 GMT it was sufficiently heavy on all observable frequencies to completely obliterate reception of all radio signals.

c. At 0615 GMT there was a sudden depression of the condition on the high frequencies although heavy disturbance continued on the low frequencies under 500 kc/s, with a strong directive effect from the northeast. Fifteen minutes later at 0630 GMT the static had nearly disappeared from the low frequencies, only occasional spikes being identifiable on the oscilloscope on frequencies below 1500 kc/s.

d. The condition remained virtually out until 1130 GMT when it reappeared at moderate strength on frequencies below 1000 kc/s with a directive effect from the north-northeast. At 1240 GMT the static suddenly appeared on the high frequencies up to 30 mc/s. At 1415 the condition began to fade from the high frequencies and by 1420 was audible only on the low frequencies, roughly under 500 kc/s. Deterioration in this band was very slow and gradual, and normalcy was not attained until 0155 GMT on 16 March. No further recurrences were identifiable.

4. The static next occurred on 24 March 1955 around 1145 GMT with intensity and directivity characteristics similar to those of the preceding report. The first fadeout was at 0630 GMT 25 March, with recurrence at approximately 1200 GMT 25 March. Similar deterioration and fadeout in the early hours of 26 March were followed by cyclical recurrences of the same type during approximately the same hours of 26 and 27 March, with final disappearance about 0600 GMT 28 March. The 26 and 27 March recurrences were confined to lower frequencies, and progressively diminished. Directive effects remained northeasterly.

a. Beginning 1500 GMT, 24 March, a tape recording was made comprising two minute samples of the condition each hour. The tape was run at a speed of 7½ inches per second. The antenna used on the intercept was varied according to the shifting directional character of the static, but all other factors were kept constant. A Signal Corps BC-779B superheterodyne receiver tuned to 142 kc/s was used; this frequency appeared to offer more continuity of observation and more freedom from extraneous signals than any other. Sensitivity of the receiver was adjusted to maximum, AVC on, noise limiter off, bandwidth 3 (medium), and the audio control at "1"--in which position only strong signals can be heard. Using a General Radio model LP-1 signal generator, an RF signal of 20 microvolts, modulated 50% at 1000 c.p.s. and keyed in a series of dashes, was injected at approximate 15 second intervals to provide a comparison with the strength of the static. The final sample on the tape at 0700 GMT, 25 March, reflects normal conditions. A peculiar effect

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may be noted in the sample preceding, i.e. at 0600 GMT; spurious sideband radiations appear from Ankara and Bucharest broadcasting stations, which transmit on 183 and 155 kc/s respectively. This effect was checked with other equipment and found to be the same on all receivers and all longwave antennas, regardless of direction. It has never been observed under normal conditions.

5. On 31 March 1955 the atypical static was again heard beginning about 1200 GMT but reaching, around 2200 GMT 31 March to 0100 GMT 1 April, a stronger intensity than the preceding occasion. Intensity ebbed after 0100 and static disappeared from all high frequencies in about two hours. Until about 0230 intense static remained below 2 mc/s, but by 0300 it had faded to a point where only intermittent bursts were heard. During 0300 to 0500 GMT deterioration ensued below 500 kc/s, with complete fadeout into normal atmospheric conditions at 0500. Directive effects seemed to vary as time progressed but for the first four hours were strongest from the northeast. At 1700 GMT strength from the northeast lessened and new peaks were observed with antennas B-1 and B-8, 281° and 101° true respectively. During the period 1800-2000 GMT peaking was on B-1 and B-8 only, and by 2200 GMT had abated from B-1. From 2200 GMT 31 March until 0300 GMT 1 April directivity seemed spread over antennas B-3 (333° true), B-5 (23° true), B-6 (51° true) and B-8. From 0300 to 0500 the westerly shift continued with directivity peaking at B-5, B-6 and especially B-8. By 0500 GMT 1 April the static had faded into the normal atmospheric level. It was observed on low frequencies alone from 1200 GMT 31 March until 2200; from then until 0100 GMT 1 April, the strongest period on the low frequencies, it was also observed on medium and high frequencies with directivity from true north and with peaks about the following frequencies: 2.7 to 3, 11.4, 13.3, 14.2, 18.2, 21.3, 32.5, 41.0 and 50.0 mc/s.

a. During the above observations a tape recording was made under the same standard conditions stated in paragraph 4a, with the exception that in this instance the antenna in use was also kept constant; B-6, bearing 51° true, was used throughout. The monitor reports that the peak strength during this recording was of substantially greater intensity.than the previous recording.

b. The condition reappeared, between approximately 1300 GMT 1 April and 0400 GMT 2 April, and 1300 GMT 2 April and 0400 GMT 3 April, progressively diminishing each day. On 3 April from 1200 GMT it was observed with significantly lower intensity until 0730 GMT 4 April. Observers believe the condition recurred 4/5 April and 5/6 April but the intensity was so close to normal atmospheric level that it could not be identified positively. The general daily antenna directivity pattern was as follows: normal fading was on B-6 or B-5, with intensity building up gradually until heard on all

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other B antennas around the hours 1800 to 0100. During the morning fadeout B-8 and B-1 gave strongest intercept and last fadeout, with B-5 and B-6 ranking next.

6. The next occurrence of this static condition began about 1100 GMT 7 April and continued to 0300 GMT on 8 April, with strongest effect between 1400 and 2200 GMT 7 April 1955. It was almost entirely confined to low frequencies (roughly under 500 kc/s), with only a barely detectable effect on the high frequencies at the strongest peak. Directivity peaked with antenna B-6, with secondary peak on B-1 up to 1500 GMT; from 1500 to 2300 GMT this condition was reversed. From 2300 until 0300 fadeout directivity prevailed on B-6. Only normal atmospherics were observed on days following.